Next Generation Science Standards – Waves, Wetlands, and Watersheds

Chapter 3	**Activity 3.1: Wetlands at Work**	**Activity 3.2: Marsh Munchers**	**Activity 3.3: The Perfect Beak**
K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.			•
K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.			•
2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.		•	•
3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	•	•	•
4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.			•
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	•		
5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.		•	

Chapter 4	**Activity 4.1: Moving Mountains to the Sea**	**Activity 4.2: No Ordinary Sandy Beach**	**Activity 4.3: Beach in a Pan**
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	•	•	•
4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.		Extension	
4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.			•
5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.			•

Chapter 5	**Activity 5.1: A Drop in the Bucket**	**Activity 5.2: Alice in Waterland**	**Activity 5.3: Branching Out**
2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.	•		

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.		•	
4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.	Extension		•
5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	•		
5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.		•	
5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.			•
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.		•	

Chapter 6	**Activity 6.1: Beaches—Here Today, Gone Tomorrow?**	**Activity 6.2: Shifting Sands**	**Activity 6.3: Rollin' Down the Sand Highway**
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.		•	•
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	•	•	•
4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.			•
5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	•	•	•
MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	•	•	•
MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	•	•	•
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.			•
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.			•

Chapter 7	**Activity 7.1: What's So Special About Native Species?**	**Activity 7.2: Adapted for Survival?**	**Activity 7.3: Survivor: California**
MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	•		
MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.		•	•
MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations	•		
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	•		•
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment	Extension		
HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.			•
HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.	•		•

Chapter 8	**Activity 8.1: Keep Your Head Above Water**	**Activity 8.2: You Are What You Eat**	**Activity 8.3: The Edge of the Wedge**
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment		•	
MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	•		
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	•		
Science and Engineering Practices: • Develop a model to describe phenomena. • Science knowledge is based upon logical connections between evidence and explanations.	•		•

Community Action Activities	**Activity CA.1: Marine Debris: It's Everywhere**	**Activity CA.2: Searching Out Nonpoint Sources of Pollution**	**Activity CA.3: Clean Shorelines, Clean Oceans: Shoreline Cleanup**	**Activity CA.4: Preventing Pollution at the Source**
K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	•		•	•
K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	•			•
2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.			•	
3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	•		•	•
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	•	•		•
4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.		•		
5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	•	•		
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	•	•		•
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.			•	
MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a	•	•	•	•

successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.				
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	•			•
HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity	•	•		•
HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	•	•	•	•
HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	•	•	•	•
HS-ETS1-2. Design a solution to a complex real world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	•			•
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.				•